CLAIMS

What is claimed is:

1. A contrast enhancement agent useful for providing a visible image of a biological sample comprising at least one peptide comprising the amino acid sequence NXEQVSP (SEQ ID NO: 1), wherein X is any amino acid, at least one paramagnetic metal ion and at least one chelator.

2. The contrast enhancement agent of claim 1, wherein the paramagnetic metal ion is selected from the group consisting of transition, lanthanide and actinide elements.

3. The contrast enhancement agent of claim 2, wherein the paramagnetic metal ion is selected from the group consisting of Gd(III), Mn(II), Cu(II), Cr(III), Fe(II), Fe(III), Co(II), Er(II), Ni(II), Eu(III) and Dy(III).

4. The contrast enhancement agent of claim 1, wherein the chelator is selected from the group consisting of DTPA, substituted DTPA, DOTA, substituted DOTA, EDTA, substituted EDTA, CDTA and substituted CDTA.

5. The contrast enhancement agent of claim 1, wherein the peptide comprises the amino acid sequence NQEQVSP (SEQ ID NO: 2), the paramagnetic metal ion is gadolinium and the chelator is DTPA.

6. The contrast enhancement agent of claim 1, wherein the peptide comprises the amino acid sequence NGEQVSP (SEQ ID NO: 3), the paramagnetic metal ion is gadolinium and the chelator is DTPA.

7. The contrast enhancement agent of claim 1, wherein the agent is in lyophilized form.

8. A method for preparing a contrast enhancement agent, the method comprising:

(a) preparing a contrast enhancement agent wherein the agent is in lyophilized form; and

(b) admixing the contrast enhancement agent with an aqueous pharmaceutically acceptable diluent, whereby a contrast enhancement agent is prepared.

9. The method of claim 8, wherein the aqueous pharmaceutically acceptable diluent is phosphate buffer saline.

10. A method of non-invasively generating a visible image of a biological sample, the method comprising:

(a) providing a contrast enhancement agent comprising at least one peptide comprising the sequence NXEQVSP (SEQ ID NO: 1), wherein X is any amino acid, at least one paramagnetic metal ion and at least one chelator;

(b) introducing the contrast enhancement agent to a biological sample; and

(c) scanning the biological sample using magnetic resonance imaging, whereby a visible image of a biological sample is non-invasively generated.

11. The method of claim 10, wherein the paramagnetic metal ion is selected from the group consisting of transition elements and inner transition elements.

12. The method of claim 11, wherein the paramagnetic metal ion is selected from the group consisting of Gd(III), Mn(II), Cu(II), Cr(III), Fe(II), Fe(III), Co(II), Er(II), Ni(II), Eu(III) and Dy(III).

13. The method of claim 10, wherein the chelator is selected from the group consisting of DTPA, substituted DTPA, DOTA, substituted DOTA, EDTA, substituted EDTA, CDTA and substituted CDTA.

14. The method of claim 10, wherein the imaging agent is disposed in a pharmaceutically acceptable diluent.

15. The method of claim 10, wherein the biological sample is disposed in a subject.

16. The method of claim 15, wherein the subject is a mammal.

17. The method of claim 16, wherein the mammal is a human.

18. The method of claim 16, wherein the mammal is selected from the group consisting of mouse, cat and dog.

19. The method of claim 15, wherein the biological sample is tumor tissue.

20. The method of claim 15, wherein the biological sample is blood.

21. The method of claim 15, wherein the biological sample is a blood clot.

22. The method of claim 15, wherein the biological sample is tissue undergoing angiogenesis.

23. The method of claim 15, wherein the biological sample is wounded tissue.

24. A kit for obtaining a visible image of a biological sample comprising a two-vial system of a lyophilized contrast enhancement agent of claim 1 and an aqueous diluent, comprising:

(a) a first vial comprising a lyophilized contrast enhancement agent, wherein the agent comprises a peptide comprising the amino acid sequence

NXEQVSP (SEQ ID NO: 1), wherein X is any amino acid, at least one paramagnetic metal ion and at least one chelator; and

(b) a second vial comprising a pharmaceutically acceptable diluent.

25. The kit of claim 24, wherein the lyophilized contrast enhancement agent comprises gadolinium, DTPA and a peptide comprising the sequence NXEQVSP (SEQ ID NO: 1), wherein X is any amino acid, and the pharmaceutically acceptable diluent comprises phosphate buffer saline.